

Claims

1. A multi-carrier communication apparatus for transmitting data using a plurality of sub-carriers, comprising:
 - 5 a determining unit which determines a pattern of particular signals associated with first data;
 - an allocating unit which allocates the determined pattern to sub-carriers of a matrix, the matrix is formed by arranging a plurality of sub-carriers arranged in a direction of a frequency axis in a direction of a time axis;
 - 10 an allocating unit which allocates sub-carriers modulated by second data to a part of the matrix other than the particular signals; and
 - 15 a transmitting unit which transmits the particular signals allocated to the matrix and the sub-carriers modulated by the second data.
2. A multi-carrier communication apparatus, comprising:
 - 20 a detecting unit which detects a pattern of particular signals associated with first data which are allocated to sub-carriers of a matrix formed by arranging a plurality of sub-carriers arranged in a direction of a frequency axis obtained from received data in a direction of a time axis;
 - 25 a restoring unit which restores the first data associated with the detected pattern; and
 - a demodulating unit which demodulates second data from sub-carriers which are modulated by the second data allocated to a part of the matrix other than the particular signals.

3. The multi-carrier communication apparatus as set forth in claim 1 or 2,
wherein each of the plurality of sub-carriers arranged in the direction of the
frequency axis has an orthogonal relationship with a sub-carrier adjacent
5 thereto.